REPORT NO: RW-49R-84

# Special REPORT

SH-60B/DDG-994 DYNAMIC INTERFACE TESTS

by

CDR S. L. Madey, USN
Mr. J. C. Petz



FIRST INTERIM REPORT



Prepared for: NAVAL AIR SYSTEMS COMMAND
AIRTASK A511-5115B/0532/3266-000-702
WORK UNIT A53012C1-01





NAVAL AIR TEST CENTER
PATUXENT RIVER, MARYLAND

NAVAL AIR TEST CENTER
NAVAL AIR STATION
Patuxent River, Maryland 20670

A511-5115B/0532/3266-000-702
A53012C1-01
RW-49R-84

From: Commander, Naval Air Test Center, Patuxent River, Maryland 20670
To: Commander, Naval Air Systems Command (AIR-53012C1), Washington, D.C. 20361

Subj: NAVAIRTESTCEN Special Report RW-49R-84, SH-60B/DDG-994 DYNAMIC INTERFACE TESTS, First Interim Report, AIRTASK A511-5115B/0532/3266-000-702, Work Unit A53012C1-01

Ref: (a) AIRTASK A511-5115B/0532/3266-000-702, Work Unit A53012C1-01 of 30 Sep 1983

Encl: (1) Dynamic Interface Pilot Rating Scale
(2) SH-60B/DDG-993 Data Envelopes
(3) Preliminary Tabulated SH-60B/DDG-993 Launch/Recovery Data Envelopes

1. NAVAIRTESTCEN was tasked by reference (a) to conduct dynamic interface (DI) testing of the SH-60B helicopter on the DDG-993 class ships. Testing was conducted on board the USS CALLAGHAN, DDG-994, from 14 through 18 May 1984. Lack of ambient winds precluded completion of day/night launch/recovery envelopes. Further testing is possible 11 through 15 June 1984. Data were collected using the DI Pilot Rating Scale (PRS) presented in enclosure (1). The evaluations were conducted under the following test conditions:

| Test Time (hr) (Day/Night) | Test Period (Day/Night) | Pitch/Roll (deg) (Maximum) | Total Landings (Day/Night) | True Wind (kt) (Minimum/Maximum) |
|---|---|---|---|---|
| 7.2/9.5 | 5/4 | 4/7 | 77/44 | 0/21 |

2. The day/night SAS/BOOST ON, day SAS/BOOST OFF, and night SAS OFF SH-60B/DDG-993 class ship launch/recovery data and data fairings are presented in enclosure (2). The envelopes boundaries are based on pilot ratings or on available ambient

true winds. The pilot ratings were based on workload resulting from degradation of aircraft flying qualities or performance, excessive ship's pitch and roll, or extreme relative wind direction or speed.

3. The preliminary launch/recovery envelopes are tabulated in enclosure (3). A final Report of Test Results will be forwarded by separate correspondence.

B. W. WITHERSPOON
By direction

RW-49R-84

# DYNAMIC INTERFACE PILOT RATING SCALE

Defining Relative Degrees of Pilot Effort
Required for Conducting Helicopter
Launches and Recoveries during
Shipboard Operations

| PRS No. | Pilot Effort | Description |
|---|---|---|
| 1 | Slight | No problems; minimal pilot effort required. |
| 2 | Moderate | Consistently safe launch and recovery operations under these conditions. These points define the fleet limits recommended by NAVAIRTESTCEN. |
| 3 | Maximum | Landings and takeoffs successfully conducted through maximum effort of experienced test pilots under controlled conditions. These evolutions could not be consistently repeated by fleet pilots under operational conditions. Loss of aircraft or ship system is likely to raise pilot effort beyond capabilities of average fleet pilot. |
| 4 | Unsatisfactory | Pilot effort and/or controllability reach critical levels, and repeated safe landings and takeoffs by experienced test pilots are not probable, even under controlled test conditions. |

Enclosure (1)

RW-49R-84

SH-60B/DDG-993 DATA ENVELOPES

Enclosure (2)

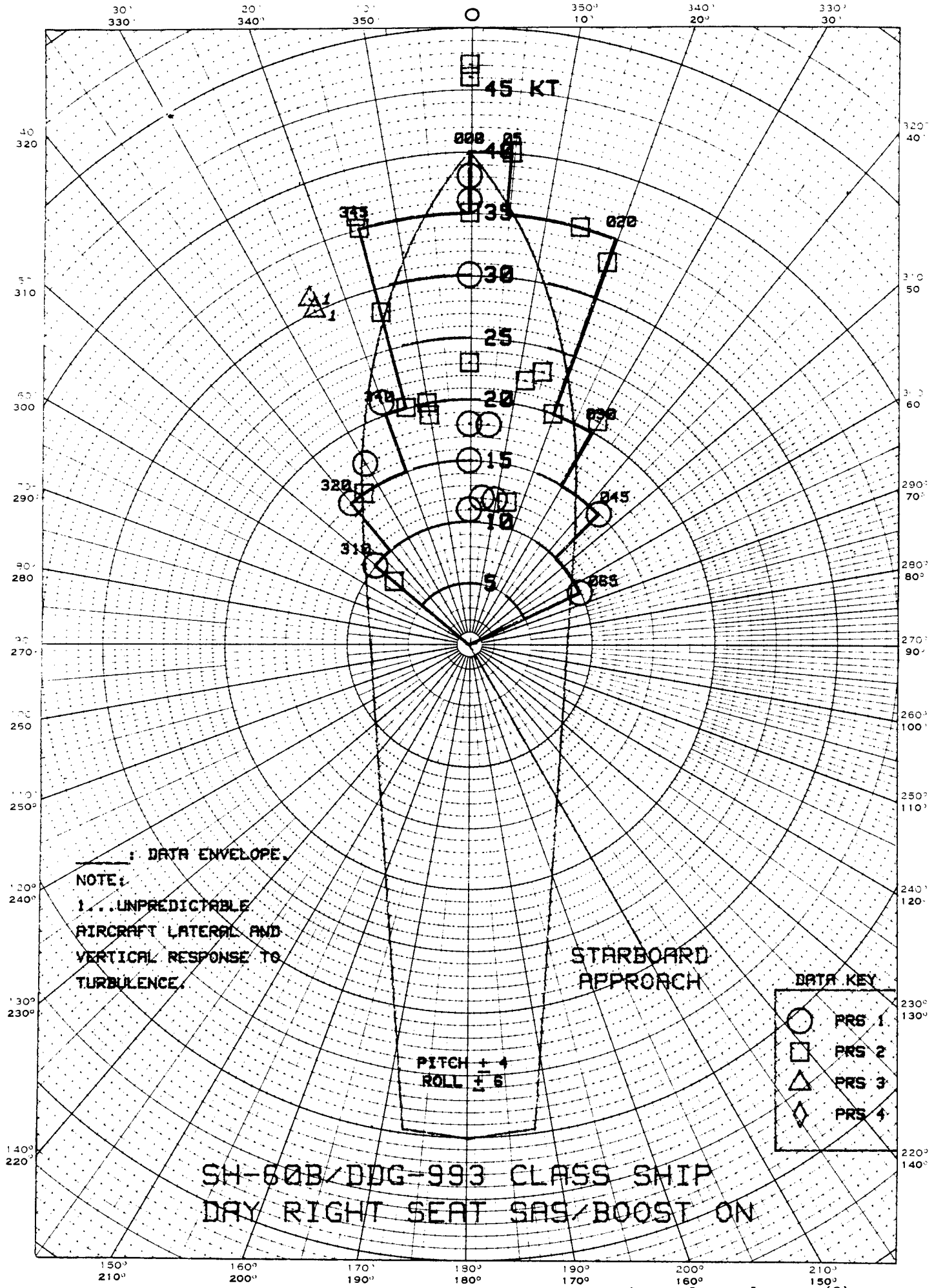


Figure 1, Enclosure (2)

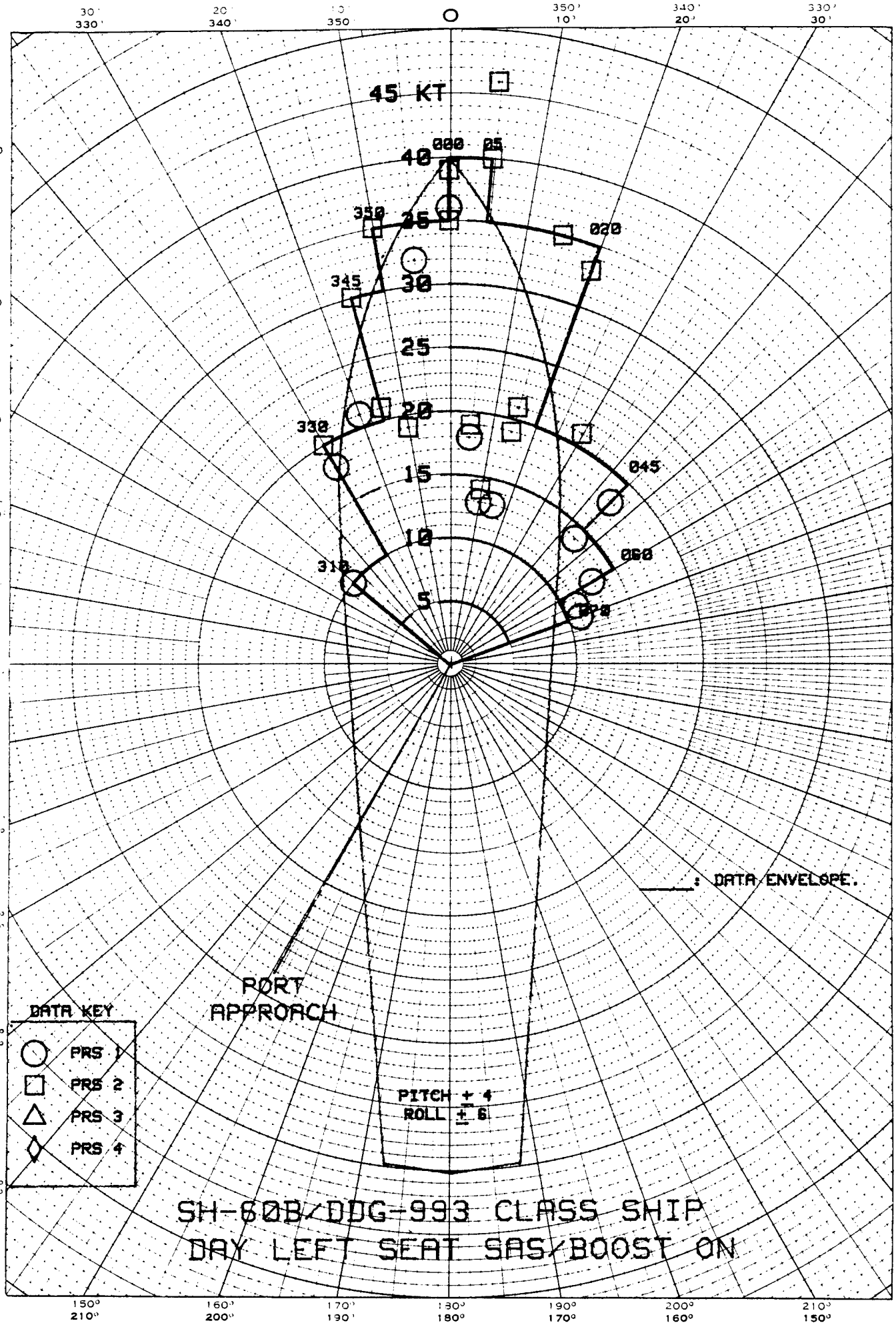


Figure 2, Enclosure (2)

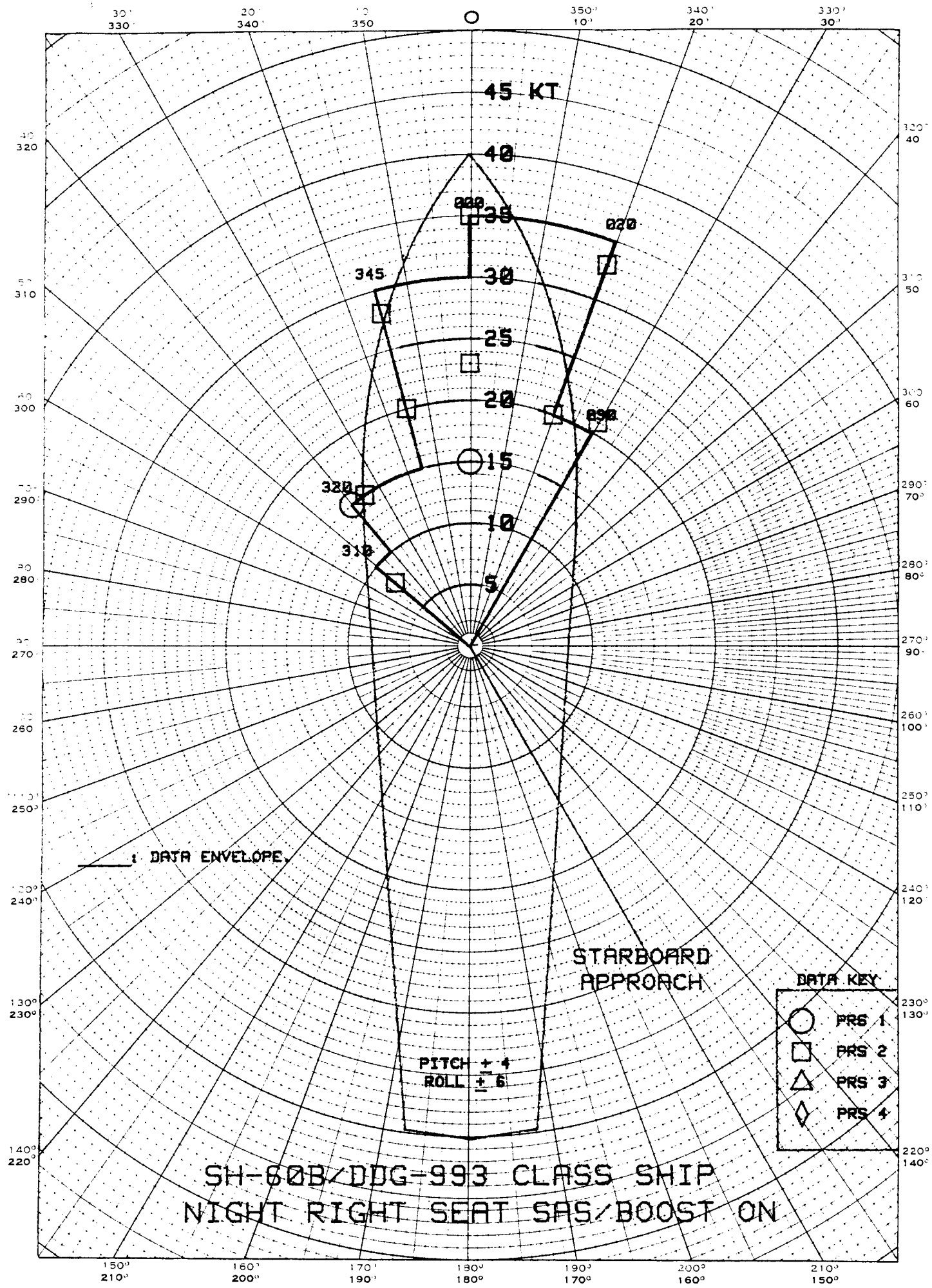


Figure 3, Enclosure (2)

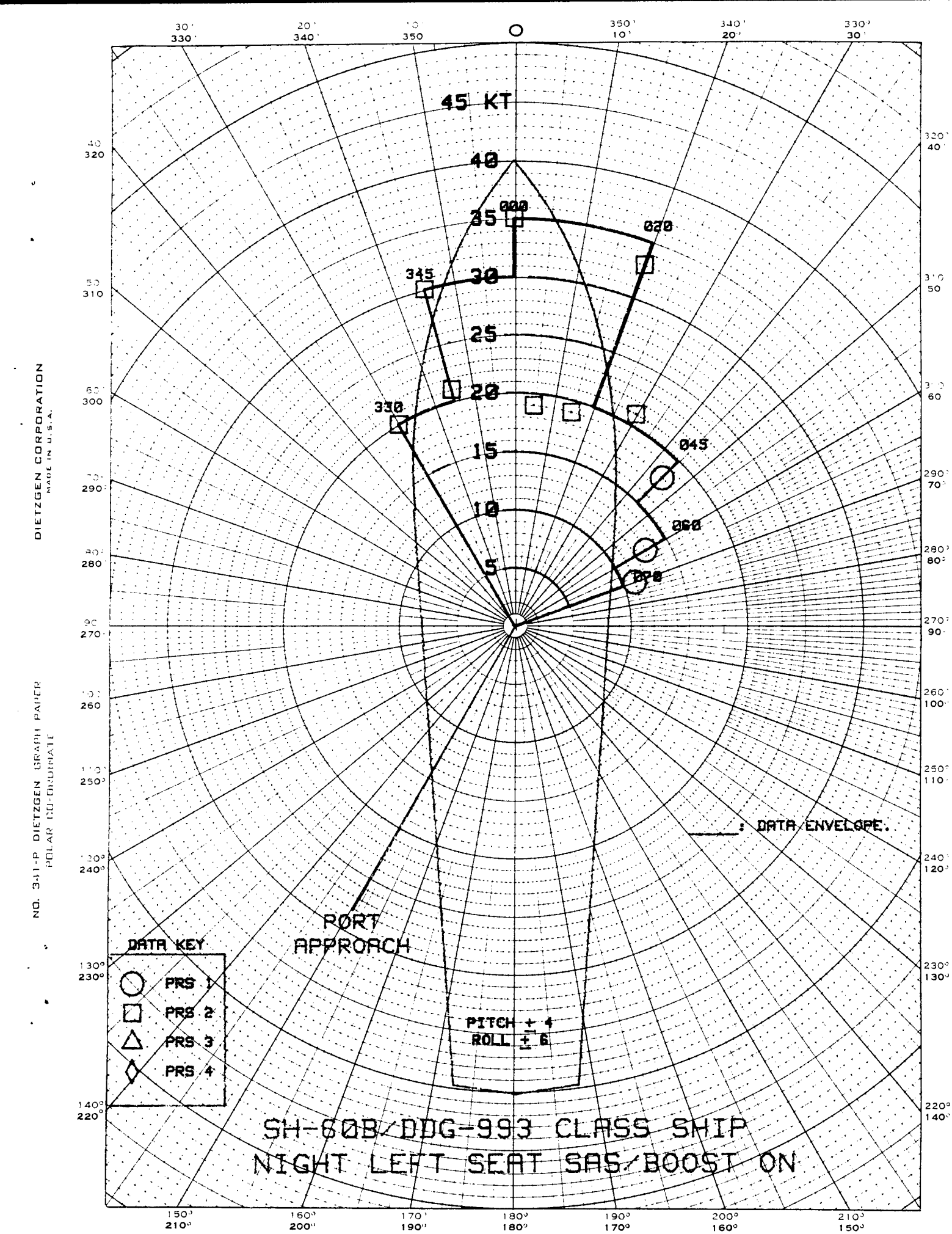


Figure 4, Enclosure (2)

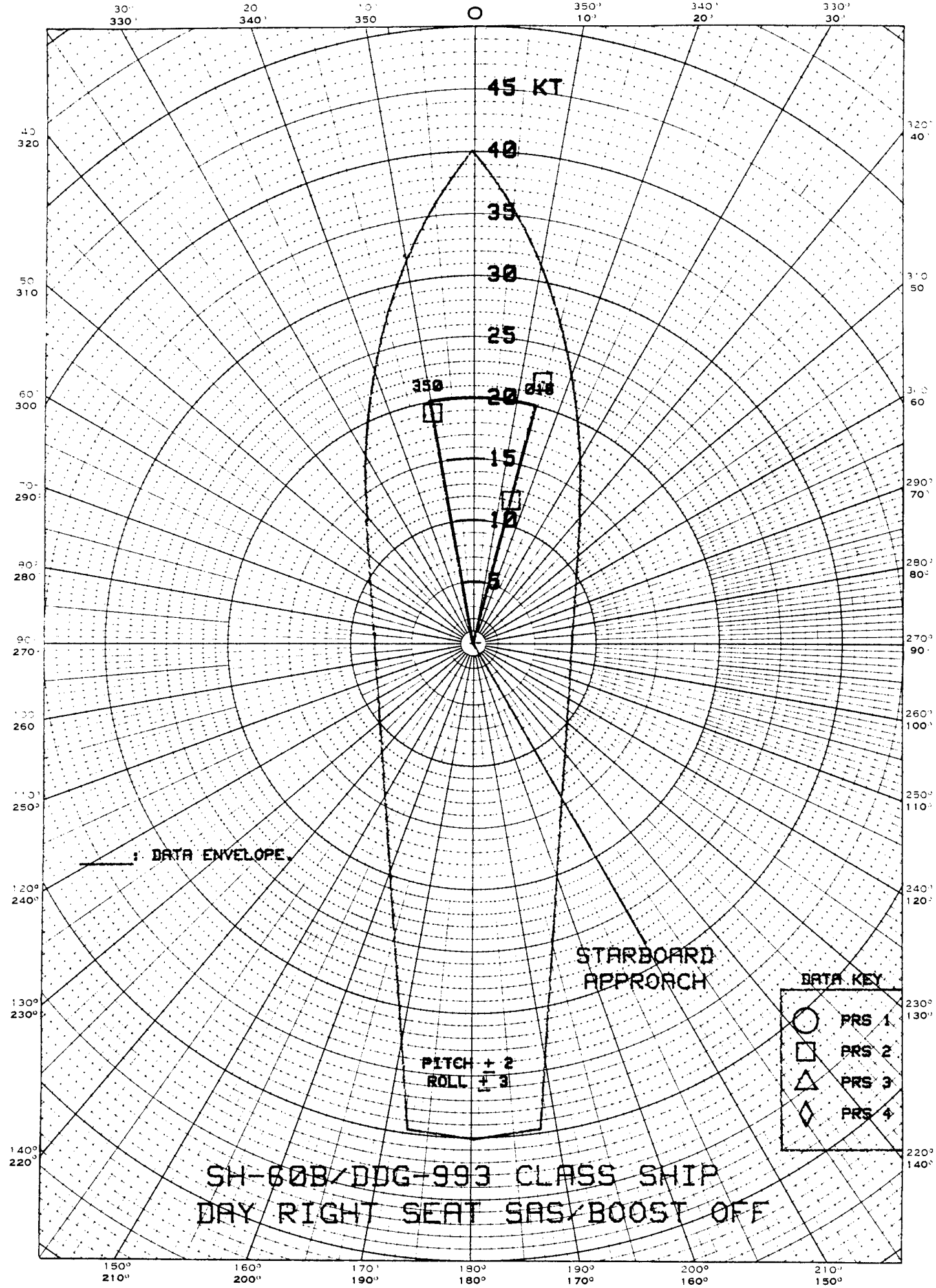


Figure 5, Enclosure (2)

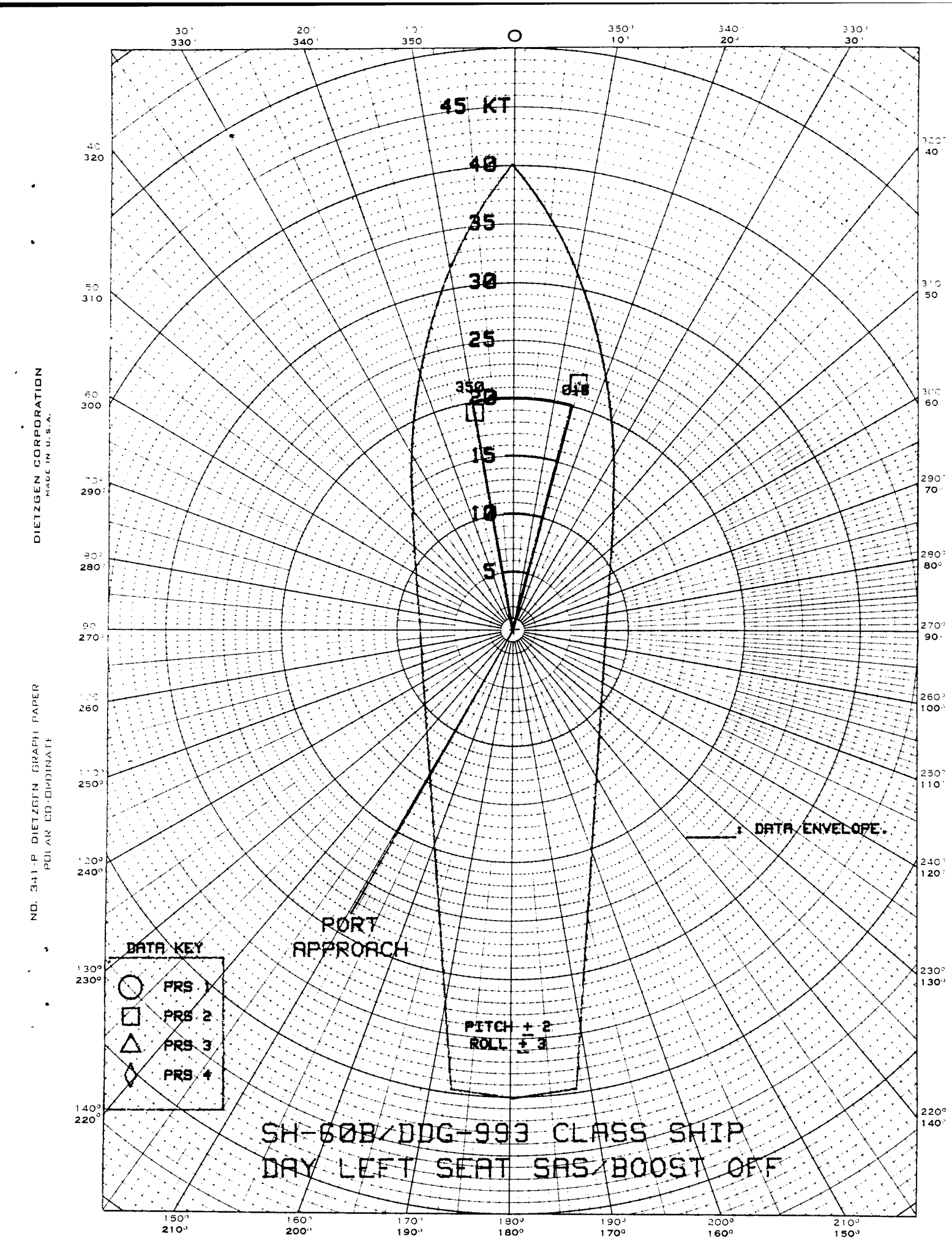


Figure 6, Enclosure (2)

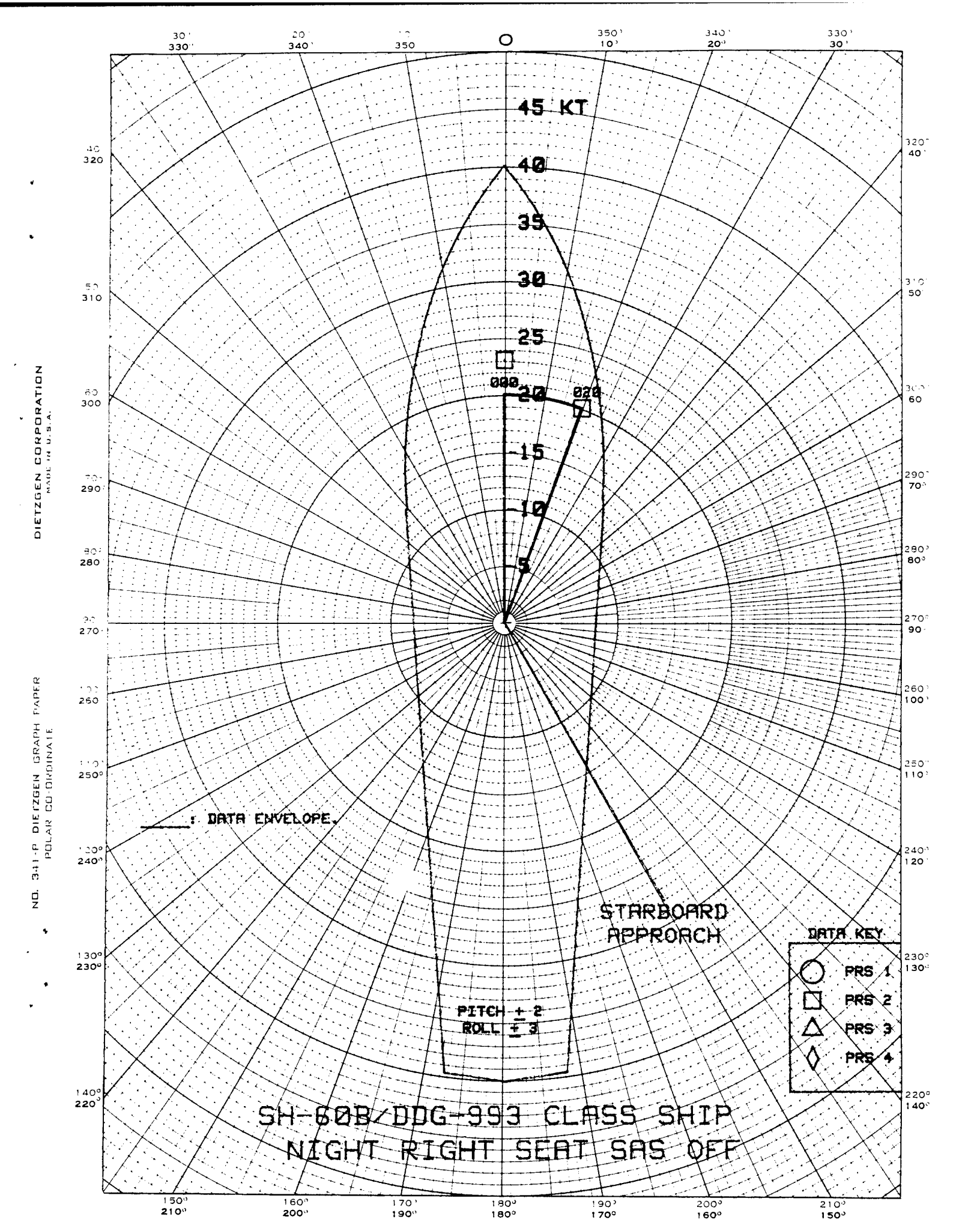


Figure 7, Enclosure (2)

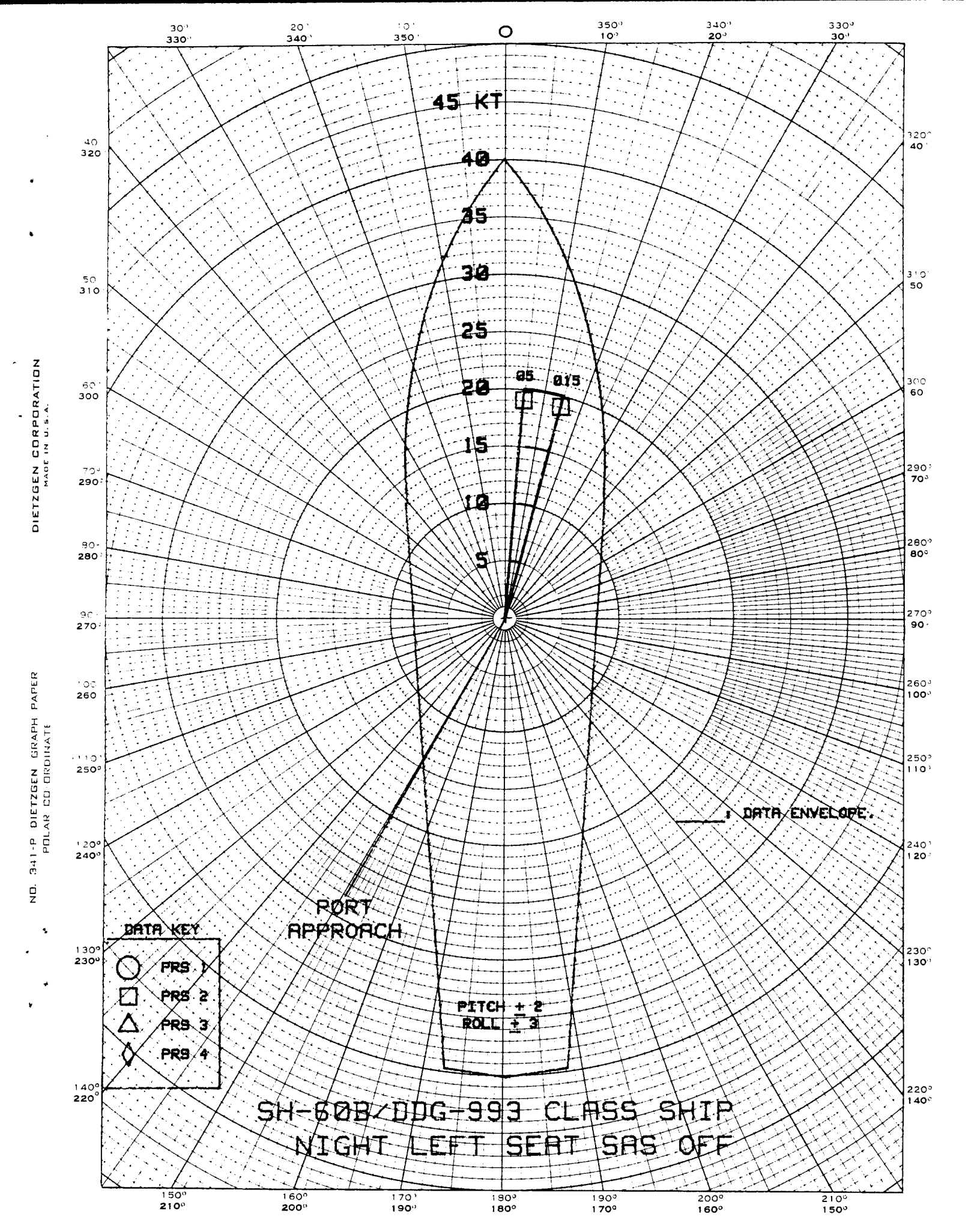


Figure 8, Enclosure (2)

PRELIMINARY TABULATED SH-60B/DDG-993 LAUNCH/RECOVERY DATA ENVELOPES

| | Starboard Approach Relative Wind (Direction/Speed) | Port Approach Relative Wind (Direction/Speed) |
|---|---|---|
| DAY OPERATION | 000-005/40 | 000-005/40 |
| | 005-020/35 | 005-020/35 |
| | 020-030/20 | 020-045/20 |
| | 030-045/15 | 045-060/15 |
| | 045-065/10 | 060-070/10 |
| | 065-310/0 | 070-310/0 |
| | 310-320/10 | 310-330/10 |
| | 320-340/15 | 330-345/20 |
| | 340-345/20 | 345-350/30 |
| | 345-360/35 | 350-360/35 |

NOTES: (1) 4 deg ship pitch, 6 deg ship roll.
(2) SAS/BOOST ON.

| | | |
|---|---|---|
| NIGHT OPERATION: | 000-020/35 | 000-020/35 |
| | 020-030/20 | 020-045/20 |
| | 030-310/0 | 045-060/15 |
| | 310--320/10 | 060-070/10 |
| | 320-345/15 | 070-330/0 |
| | 345-360/30 | 330-345/20 |
| | | 345-360/30 |

NOTES: (1) 4 deg ship pitch, 6 deg ship roll.
(2) SAS/BOOST ON.

| | | |
|---|---|---|
| EGRADED DAY: | 000-015/20 | 000-015/20 |
| | 015-350/0 | 015-350/0 |
| | 350-360/20 | 350-360/20 |

NOTES: (1) 2 deg ship pitch, 3 deg ship roll.
(2) SAS/BOOST OFF.

| | | |
|---|---|---|
| DEGRADED NIGHT: | 000-020/20 | 000-005/0 |
| | 020-360/0 | 005-015/20 |
| | | 015-360/0 |

NOTES: (1) 2 deg ship pitch, 3 deg ship roll.
(2) SAS OFF.

# PRELIMINARY TABULATED SH-60B/DDG-993 LAUNCH/RECOVERY DATA ENVELOPES